

CLAIMS

What is claimed is:

1. An apparatus comprising:
 - a reflector;
 - a light source for producing light of a first polarization and light of a second polarization;
 - a linear polarizer which substantially passes light of the first polarization and substantially reflects light of the second polarization; and
 - a phase retarder disposed between the reflector and the linear polarizer.
2. The apparatus of claim 1 wherein the phase retarder comprises a quarter-wave phase retarder.
3. The apparatus of claim 1 wherein the light source is disposed between the reflector and the phase retarder.
4. The apparatus of claim 1 wherein the linear polarizer comprises an optical substrate with a micro-structured wire grid type polarizer surface.
5. The apparatus of claim 4 wherein the linear polarizer further comprises airflow gaps for cooling the linear polarizer.
6. The apparatus of claim 1 wherein the reflector comprises a substantially parabolic mirror, and wherein the light source is disposed substantially at a focus of the parabolic mirror.
7. The apparatus of claim 6 wherein the linear polarizer comprises a substantially planar structure.
8. The apparatus of claim 6 wherein the linear polarizer and the phase retarder are suitably sized to collect light emitted from the reflector.
9. The apparatus of claim 1 wherein the light source is disposed between the phase retarder and the linear polarizer.
10. The apparatus of claim 9 wherein the phase retarder is mechanically coupled to the reflector and has substantially a same shape as the reflector.

- 1 11. The apparatus of claim 10 wherein the phase retarder and the reflector are substantially
2 parabolic.
- 1 12. The apparatus of claim 9 wherein the light source comprises a substantially spherical light
2 cavity having a reflective inner surface, and having a first window and a second window through the
3 reflective inner surface, the first and second windows being disposed at substantially opposite sides
4 of the light cavity.
- 1 13. The apparatus of claim 12 wherein the phase retarder and the reflector are disposed
2 substantially in an optical path with the first window, and the linear polarizer is disposed
3 substantially in an optical path with the second window.
- 1 14. The apparatus of claim 13 wherein the phase retarder, the reflector, and the linear polarizer
2 are of substantially planar shape.
- 1 15. The apparatus of claim 9 wherein the light source comprises:
2 an RF-driven plasma light source having a bulb, and having a reflective coating surrounding
3 the bulb and the phase retarder.
- 1 16. An apparatus comprising:
2 a curved reflector having a concave reflective surface;
3 a quarter-wave phase retarder in an optical path with the curved reflective surface; and
4 a linear polarizer in the optical path.
- 1 17. The apparatus of claim 16 further comprising:
2 a light source in the optical path.
- 1 18. The apparatus of claim 16 wherein the curved reflector has a substantially parabolic shape.
- 1 19. The apparatus of claim 16 wherein the curved reflector has a substantially semi-parabolic
2 shape.
- 1 20. The apparatus of claim 18 wherein the quarter-wave phase retarder and the linear polarizer
2 are of substantially planar shape.

1 21. The apparatus of claim 20 further comprising:

2 a light source in the optical path and having a substantially spherical shape, a reflective
3 interior, and two windows of reduced reflectivity, one of the windows positioned to transmit light to
4 the quarter-wave phase retarder and the reflector, and the other of the windows positioned to transmit
5 light to the linear polarizer.

1 22. The apparatus of claim 18 wherein the quarter-wave phase retarder has the substantially
2 parabolic shape and the linear polarizer has a substantially planar shape.

1 23. A system comprising:

2 linear polarizer means for transmitting light of a first polarization and for reflecting light of a
3 second polarization;

4 phase retarder means for altering polarization of the light of the second polarization reflected
5 from the linear polarizer means; and

6 reflector means for reflecting the altered polarization light from the phase retarder means
7 back to the linear polarizer means.

1 24. The system of claim 23 wherein the reflector means is disposed so as to reflect the altered
2 polarization light back through the phase retarder means, and wherein the phase retarder means is
3 further for re-altering polarization of the light from the reflector.

1 25. The system of claim 24 wherein the phase retarder means is for altering the polarization of
2 the light from the linear polarizer by one quarter phase and the light from the reflector by one quarter
3 phase, to impart a one half phase alteration in polarization to light passing through it twice in the
4 course of bouncing between the linear polarizer and the reflector.

1 26. The system of claim 23 further comprising means for providing the light of the first and
2 second polarizations.

1 27. The system of claim 26 wherein the means for providing the light is disposed between the
2 phase retarder means and the reflector means.

1 28. The system of claim 26 wherein the means for providing the light is disposed between the
2 phase retarder means and the linear polarizer means.

1 29. The system of claim 23 wherein the reflector means comprises a substantially parabolic
2 reflector.

1 30. The system of claim 23 wherein the reflector means comprises a substantially planar
2 reflector.

1 31. The system of claim 23 further comprising a substantially spherical light source with a
2 reflective inner surface.

1 32. A method comprising:
2 transmitting first correct-polarization light through a linear polarizer;
3 reflecting wrong-polarization light from the linear polarizer;
4 correcting polarization of the wrong-polarization light to make it second correct-polarization
5 light; and
6 transmitting the second correct-polarization light through the linear polarizer.

1 33. The method of claim 32 further comprising:
2 reflecting by a reflector light that has been reflected from the linear polarizer.

1 34. The method of claim 32 wherein the correcting comprises:
2 first altering polarization of the wrong-polarization light;
3 reflecting the altered-wrong-polarization light; and
4 second altering polarization of the altered-wrong-polarization light to make it the second
5 correct-polarization light.

1 35. The method of claim 34 wherein the first and second altering each comprises:
2 passing its respective wrong-polarization light through a quarter-wave phase retarder.

1 36. The method of claim 35 further comprising:
2 generating the first correct-polarization light and the wrong-polarization light.